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TYPES OF E.P. BICKNELL'S *SISYRINCHIUM* (IRIDACEAE)

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ABSTRACT

Between 1896 and 1904 Eugene P. Bicknell described and named 78 species of *Sisyrinchium* and its segregate *Hydastylus* (Iridaceae) in the USA, Canada, and Mexico. Though many of these names are surely synonyms, others perhaps represent populations that are not wholly understood and may merit taxonomic recognition. In the absence of a published treatment that addresses these many names, an enumeration is provided that stabilizes Bicknell's names by documentation of their types and, where needed, by designation of appropriate lectotypes or neotypes. Documentation is given for the types of all species of *Sisyrinchium* and *Hydastylus* (Iridaceae) published by E.P. Bicknell. Lectotypes are designated for *Sisyrinchium amoenum*, *S. apiculatum*, *S. arenicola*, *S. asheianum*, *S. atlanticum*, *S. biforme*, *S. bushii*, *S. campestre*, *S. capillare*, *S. corymbosum*, *S. exile*, *S. flagellum*, *S. flexile*, *S. hastile*, *S. helleri*, *S. incrustatum*, *S. intermedium*, *S. macrocarpon*, *S. miamiense*, *S. pruinosum*, *S. radicatum*, *S. rosulatum*, *S. scabrellum*, *S. scoparium*, *S. strictum*, *S. tenellum*, *S. texanum*, *S. tracyi*, *Hydastylus cernuus*, *H. longipes*, and *H. rivularis*. Neotypes are selected for *Sisyrinchium dichotomum*, *S. membranaceum*, and *S. solstitiale*.

In the 1890s a resident of New York City, Eugene Pintard Bicknell (1859–1925), began to record characteristics and differences he had observed in local populations of *Sisyrinchium* (Iridaceae). He was unable to reconcile these observed differences with the then-standard treatments of the eastern USA flora and, though he was only an amateur botanist — his professional interests lay primarily in law and finance — he ventured to put forward his observations in a series of minutely detailed articles, mostly in the widely read Bulletin of the Torrey Botanical Club.

Bicknell's first presentation (1896) was a relatively modest inquiry into the number of "kinds" (the term "taxa" was, of course, yet to be coined) of *Sisyrinchium* to be found in the vicinity of New York City. For a number of years he had observed in Van Cortlandt Park two of these entities that, though similar in structure, were clearly distinct without intergrading forms. Outside the City he found a third entity with even stronger distinguishing characteristics. Though two of the three names he created or applied were incorrect (Ward 1968), he nevertheless brought into focus the characters that have well served to distinguish these three species. [By modern usage, Bicknell's plants are *S. atlanticum* Bicknell, *S. angustifolium* Miller (= *S. graminoides* Bicknell), and *S. montanum* Greene (= *S. angustifolium* Miller, sensu Bicknell).]

Bicknell, then convinced (May 1899) that *Sisyrinchium* was an "extensive *group* of species," undertook a detailed survey of the genus. He attempted to be comprehensive in the USA and Canada, though he gave only limited attention to Mexico. He did this by borrowing the holdings of both individuals and major institutions (apparently, though he was a private citizen, through the auspices of the New York Botanical Garden, whose director, N.L. Britton, had interest in his work), and by developing a widespread network of collectors, which enabled him to build an herbarium of his own. [Bicknell's private collection was given to NY by his widow in 1925.] After what must have been an intensive two years of compilation and study, he began publication of a series of papers, again in the Bulletin of the Torrey Botanical Club. Within the calendar year 1899 he released six papers, totaling

63 pages and reporting 41 new species. He continued this frenetic pace into 1900 with two papers, one documenting the Canadian species, the other reporting an additional 12 species in the segregate *Hydastylus*, which Bicknell recognized at generic level. Still other new species appeared in 1901, 1903, and 1904. Bicknell's preparation of *Sisyrinchium* in Small's compendious Flora of the Southeastern United States (1903) was significant in that only there did he present a key that summarized the differences he believed diagnostic in separating the southeastern species.

In total, Bicknell was responsible for publication of 69 species (and one variety) of *Sisyrinchium* and 9 species of *Hydastylus*. Stability of nomenclature of these perplexing plants will not be reached until a linkage is established between these names and the representative specimens of their natural populations.

Bicknell's contributions to understanding of the genus *Sisyrinchium* were not universally appreciated. A contemporary, the plant anatomist T. Holm, grumpily commented (1908) that he wished to present his own data "before the genus *Sisyrinchium* becomes entirely lost in segregates and in new species, which in late years have accumulated very rapidly ... ." Although Small retained Bicknell's treatment of the genus in the second edition of his Flora of the Southeastern United States (1913), in Small's later, better known Manual of the Southeastern Flora (1933), E.J. Alexander severely edited Bicknell's earlier text, not only deleting many of his species but even omitting mention of them in synonymy.

Bicknell's practice was to cite several, in many cases surely all, of the herbarium materials available to him. These citations generally permit a modern worker to locate the specimen referred to, though the intervening century has seen the dissolution and/or merger of some herbaria or even their destruction (Biltmore, North Carolina). Often Bicknell would note one of the cited collections to be his type, and often he would write "type" on the appropriate sheet (though at times he placed "type" on more than a single sheet of the same collection). Yet all too frequently he made no designation, leaving a later worker to puzzle which of the surviving sheets best fits the diagnosis and be considered the type.

The number of new names in Bicknell's *Sisyrinchium*, coupled with the often subtle morphological distinctions separating species, and compounded by the author's frequently unclear type documentation, has encouraged floristic writers to suppress his names in synonymy rather than attempt linkage between them and the populations they represent. Two regional studies are exceptional: the excellent treatments of *Sisyrinchium* in the Pacific Northwest (Henderson 1976) and the Rocky Mountains (Cholewa & Henderson 1984, 1985) included selection of lectotypes and has greatly assisted in fixing the meaning of certain Bicknell names. Yet many names remain insecure, perhaps listed in synonymy (e.g., Cholewa & Henderson 2002) but with no type formally assigned.

Two unpublished studies merit attention. The first, O'Connell (1955), though his preliminary studies encompassed much of the genus, included in his thesis only those species characterized by unbranched stems. The second, Hornberger (1987), borrowed and annotated a comprehensive volume of herbarium materials but reported she was limited in her field experience to the state of Arkansas and a single brief trip to Louisiana. Regrettably, both of these persons allowed their very informative theses to remain unpublished. Had their graduate dissertations been put in print, they would have encompassed much of the typification and lectotypification attempted here.

Only 30 of Bicknell's new names are now represented by holotypes. More often, either he did not designate any particular collection to be his "type," or where he did so, more than a single specimen, perhaps in different herbaria, are now known. The modern International Code of Botanical Nomenclature (McNeill et al. 2006) provides a formal process for choosing between competing type specimens, by designation of a lectotype. Where no original materials survive, the Code also

provides for selecting a replacement type, a neotype. In the following tabulation, 44 lectotypes are noted, 31 of them newly designated here. And 3 neotypes are selected, where all materials available to Bicknell are believed to no longer exist. Where lectotypes have previously been designated by others (e.g., Henderson 1976; Cholewa & Henderson 1984, 1985), their actions have been noted. The many lectotypes recorded on herbarium labels and in dissertations (O'Connell 1955; Hornberger 1987), though they have no standing under the Code, have been carefully considered and, whenever possible, retained here.

Typification

Entries in the following listing are alphabetical by the epithet. Each provides Bicknell's name, the place and date of its publication, and designation and place of deposit of its type. Where useful, additional notes are appended. It is not believed appropriate in the present format to attempt assignment of all Bicknell names to currently recognized taxa. Judgments differ here and, in the southeastern USA especially, some names may represent populations that are apparent in the field but hidden in synonymy.

Sisyrinchium alpestre E.P. Bicknell in Bull. Torrey Bot. Club 26: 453. Aug 1899. **HOLOTYPE: USA. Colorado**. [Park Co.]: "Meadow, Como," 3 Aug 1895, *Crandall & Cowan 477* (US).

Sisyrinchium amethystinum E.P. Bicknell in Bull. Torrey Bot. Club 28: 581. 1901. **HOLOTYPE: USA. Arizona**. [Pima Co.]: "Rincon Mts.," 1891, *Neally 153* (US).

Sisyrinchium amoenum E.P. Bicknell in Bull. Torrey Bot. Club 28: 584. 1901. **LECTOTYPE** (designated here): **USA. Texas**. [Brazoria Co.]: "[West] Columbia," 1 Apr 1900, *Bush 472* (NY; isolectotype MO). NOTE: If considered synonymous with *S. pruinosum*, the latter name was chosen for the combined taxon by R.L. Oliver (in Correll & Johnston 1970).

Sisyrinchium apiculatum E.P. Bicknell in Bull. Torrey Bot. Club 26: 300. Jun 1899. **LECTOTYPE** (designated here): **USA. Michigan**. [Muskegon Co.]: "Muskegon," Jun 1898, *Beal s.n.* (NY; isolectotype MSC). NOTE: NY collection is on 2 sheets, one (319420) marked "Type" by Bicknell, the second (319421) unmarked.

Sisyrinchium arenicola E.P. Bicknell in Bull. Torrey Bot. Club 26: 496. Sept 1899. **LECTOTYPE** (designated here): **USA. New York**. [Long Island,] "Hempstead," 30 Jun 1899, *Mulford s.n.* (NY). NOTE: Type is chosen from 8 syntypes cited by Bicknell. For nomenclature, see Ward (1968, 1999).

Sisyrinchium asheianum E.P. Bicknell in Bull. Torrey Bot. Club 26: 607. Sept 1899. **LECTOTYPE** (designated here): **USA. North Carolina**. [Rowan Co.]: "Wet meadows, Salisbury," 28 Apr 1897, *Ashe s.n.* (NY; isolectotypes GH, MO, NCU, PH, US). NOTE: Hornberger (1987, in ms.) has suggested the GM specimen as lectotype; but the NY specimen was kept by Bicknell. W.W. Ashe's name is not on the NY label (label reads "Biltmore Herbarium 5751") but is in his hand.

Sisyrinchium atlanticum E.P. Bicknell in Bull. Torrey Bot. Club 23: 134. 1896. **LECTOTYPE** (designated here): **USA. New York**. [Bronx Co.]: "Van Cortlandt Park, New York City," 26 Jun 1891, *Bicknell s.n.* (NY). NOTE: Bicknell cited no specimens in 1896, but referred to plants seen in Van Cortlandt Park and on the New Jersey coast. For nomenclature, see Ward (1968).

Sisyrinchium biforme E.P. Bicknell, Bull. Torrey Bot. Club 28: 575. 1901. **LECTOTYPE** (designated here): **USA. Texas**. [Austin Co.]: "San Felipe," 1835, *Drummond 324* (GH; isolectotype US). NOTE: Type chosen here is in agreement with Hornberger (1987, in ms.).

Hydastylus borealis E.P. Bicknell, Bull. Torrey Bot. Club 27: 378. Jul 1900. **LECTOTYPE** (designated by Cholewa & Henderson, Brittonia 37: 163. 1985): **USA. Washington**. [Whatcom Co.]: "Lake shore," Jul-Aug 1890, *Suksdorf 1004* (WS; isolectotypes GH, MO, UC, WS, WTU). Basionym for *Sisyrinchium boreale* (Bickn.) J.K. Henry, Fl. S. Brit. Columb. 88. 1915. = *Sisyrinchium californicum* (Ker-Gawl.) Ait., Hort. Kew 135. 1812. NOTE: Type chosen from 5 syntypes cited by Bicknell.

Hydastylus brachypus E.P. Bicknell, Bull. Torrey Bot. Club 27: 379. Jul 1900. **LECTOTYPE** (designated by Cholewa & Henderson, Brittonia 37: 163. 1985): **USA. Oregon**. [Lincoln Co.]: "Newport," 1 Jun 1892, *Mulford s.n.* (MO). Basionym for *Sisyrinchium brachypus* (Bicknell) J.K. Henry. = *Sisyrinchium californicum* (Ker-Gawl.) Ait., Hort. Kew 135. 1812. NOTE: Type chosen from 6 syntypes cited by Bicknell.

Sisyrinchium brayi E.P. Bicknell, Bull. Torrey Bot. Club 28: 585. 1901. **HOLOTYPE: USA. Texas**. [Galveston Co.]: "Flat coastal prairie, Virginia Point, opposite Galveston," 20 Apr 1899, *Bray s.n.* (NY). NOTE: If considered synonymous with *S. pruinosum*, the latter name was chosen for the combined taxon by R.L. Oliver (in Correll & Johnston, 1970).

Sisyrinchium bushii E.P. Bicknell, Bull. Torrey Bot. Club 28: 587. 1901. **LECTOTYPE** (designated here): **USA. Oklahoma**. [Creek Co.]: "Sapulpa, Indian Territory," 20 Apr 1895, *Bush 971* (NY; isolectotypes MO, US). NOTE: If considered synonymous with *S. pruinosum*, the latter name was chosen for the combined taxon by R.L. Oliver (in Correll & Johnston, 1970).

Sisyrinchium campestre E.P. Bicknell, Bull. Torrey Bot. Club 26: 341. Jul 1899. **LECTOTYPE** (designated here): **USA. Missouri**. [Atchison Co.]: "Atchison," 7 Jun 1894, *Bush 682* (MO). NOTE: Type chosen from 28 syntypes cited by Bicknell, in agreement with manuscript selections of O'Connell (1955) and Hornberger (1987).

Sisyrinchium campestre var. ***kansanum*** E.P. Bicknell, Bull. Torrey Bot. Club 26: 344. Jul 1899. **HOLOTYPE: USA. Kansas**. [Davis Co.]: "Ft. Riley," 27 Apr 1892, *Norton 514* (NY). Basionym for *Sisyrinchium kansanum* (Bickn.) Alexander, New Britt. & Br. Illust. Fl. 1: 451. 1952. NOTE: Bicknell also cited 5 paratypes.

Sisyrinchium canbyi E.P. Bicknell, Bull. Torrey Bot. Club 28: 588. 1901. **HOLOTYPE: USA. Texas**. [Brazoria Co.]: "[West] Columbia," 25 Mar 1900, *Canby 238* (NY). NOTE: *Canby 237* (GH) is of same date and location

Sisyrinchium capillare E.P. Bicknell, Bull. Torrey Bot. Club 26: 608. Dec 1899. **LECTOTYPE** (designated here): **USA. South Carolina**. [Aiken Co.]: "Aiken," May 1899, *Ashe s.n.* (NY-319439). NOTE: Bicknell cited 5 collections of the species, all by W.W. Ashe, all in April or May 1899. Label data indicated the 2 from Florida were collected in "flat woods," 13 May, "20 mi. s. Jacksonville" (thus apparently Clay Co.), and 18 May, "14 mi. s.e. Jacksonville" (thus surely St. Johns Co.). In the same month of 1899 Ashe made other collections (including the type designated here) in western South Carolina (Aiken) where the species is frequent and in Georgia. Hornberger (1987, in ms.) has proposed typifying *S. capillare* with the Florida specimen of 13 May. But the species has never again been found in n.e. Florida (incl. Duval, Clay, and St. Johns cos.), and it is unlikely that Ashe could have found it twice in separate Florida locations. The probability is high that Ashe's Florida labels reflect confused data. The type designated here is unambiguous.

Sisyrinchium carolinianum E.P. Bicknell, Bull. Torrey Bot. Club 26: 221. May 1899. **HOLOTYPE: USA. South Carolina**. [Anderson Co.]: "Andersonville," 1886, *Gibbes s.n.* (NY). NOTE: name is legitimate; see *S. fibrosum*.

Hydastylus cernuus E.P. Bicknell, Bull. Torrey Bot. Club 27: 384. Jul 1900. **LECTOTYPE** (designated here): **MEXICO. Chihuahua**. "High plains between Cusihuiriachic and Guerrero," 7 Sep 1887, *Pringle 1376* (NY; isolectotypes BR, GH, MIN, NDG, US). Basionym for *Sisyrinchium cernuum* (Bicknell) Kearney, Leafl. W. Bot. 5: 197. 1949. NOTE: Type chosen from 2 syntypes cited by Bicknell.

Sisyrinchium colubriferum E.P. Bicknell, Bull. Torrey Bot. Club 28: 589. 1901. **HOLOTYPE: USA. Texas**. [Brazoria Co.]: "Common on prairie, [West] Columbia," 9 April 1899, *Bush 66* (NY; isotype MO). NOTE: If considered synonymous with *S. pruinosum*, the latter name was chosen for the combined taxon by R.L. Oliver (in Correll & Johnston, 1970).

Sisyrinchium corymbosum E.P. Bicknell, Bull. Torrey Bot. Club 26: 218. May 1899. **LECTOTYPE** (designated here): **USA. Florida**. [Duval Co.]: "Pine barrens near Jacksonville," 1 Jun 1894, *Curtiss 4584* (US-92713; isolectotypes MO, NY, US). Syntype: **USA**. Alabama, Mobile Co.]: "damp grassy banks, Mobile," 5 Apr 1897, *Mohr s.n.* NOTE: The US specimens (two plants on same sheet) are marked "Type" in Bicknell's hand. The NY specimen was marked by Bicknell "part of type but very untypical." Query: Can a type be "untypical"?

Sisyrinchium dichotomum E.P. Bicknell, Bull. Torrey Bot. Club 26: 609. Dec 1899. **NEOTYPE** (selected here): **USA. North Carolina**. [Rutherford Co.]: "Sugarloaf Mountain, flowers white," 25 Jul 1933, *Grover s.n.* (TENN). NOTE: Neotype is chosen in agreement with that selected by Hornberger (1987, in ms.). The holotype (Rutherford Co., Chimney Rock, 11 May 1899, *Ashe*?) is lost, presumably with destruction of the Biltmore Herbarium, Asheville, NC.

Sisyrinchium eastwoodiae E.P. Bicknell, Bull. Torrey Bot. Club 31: 385. 1904. **HOLOTYPE: USA. California**. [San Bernadino Co.]: "In meadows, San Bernadino Valley," May 1886, *Parish 663* (NY; isotypes BR, MO). NOTE: Bicknell (1904) also cited 8 paratypes, from Kern Co. (*Greene*, in 1889; *Eastwood*, in 1894), from San Bernadino Co. (*Parish*, in 1880, 1888, 1889, 1894), and from San Diego Co. (*Henshaw*, in 1803; *Palmer* 1875), all now presumed NY.

Sisyrinchium ensigerum E.P. Bicknell, Bull. Torrey Bot. Club 28: 580. 1901. **HOLOTYPE: USA. Texas**. [Bexar Co.]: "San Antonio," 1884, *Jermy s.n.* (US-92716; isotype US).

Sisyrinchium exile E.P. Bicknell, Bull. Torrey Bot. Club 28: 573. 1901. **LECTOTYPE** (designated here): **USA. Texas**. [Galveston Co.]: "Sandy sea shores at Galveston," 25 Feb 1890, *Bodin 73* (US; isolectotype MIN). NOTE: Bicknell (1901) cited 2 duplicates. The present selection is the reverse of that of Hornberger (1987, in ms.).

Sisyrinchium farwellii E.P. Bicknell, Bull. Torrey Bot. Club 26: 298. Jun 1899. **LECTOTYPE** (designated by Ward, Taxon 48: 584. 1999): **USA. Michigan**. [Oakland Co.]: "Birmingham," 27 Sep 1898, *Farwell 1625* (NY; isolectotypes BLH, GH, MSC). NOTE: Alexander (in Gleason, 1952) treated *S. farwellii* as a form of *S. atlanticum*. Voss (1966, 1972), noting priority of the name over *S. arenicola*, retained *S. farwellii* as unique to the type collection. Type was annotated by Cholewa & Henderson in 1994 as "*Sisyrinchium fuscatum* Bicknell;" this use was accepted by Gleason & Cronquist (1991), Cholewa & Henderson (2002), and Voss & Reznicek (2012).

Sisyrinchium fibrosum E.P. Bicknell, Small, Fl. S.E. U.S. ed. 1, 298. 1903. Nom. succed.: *S. carolinianum* Bicknell (1899). NOTE: Bicknell (in Small 1903) proposed this name as substitute for *S. carolinianum* Bickn., a presumed later homonym of *S. carolinianum* Klotzsch ex Klatt (1861). But Klatt was merely citing in synonymy a herbarium name used by Klotzsch; Klatt's name was not validly published, thus poses no impediment to *S. carolinianum*.

Sisyrinchium flaccidum E.P. Bicknell, Bull. Torrey Bot. Club 28: 591. 1901. **HOLOTYPE: USA. Texas**. [Brazoria Co.]: "[West] Columbia," 6-7 Apr 1899, *Bush 466* (NY; isotypes MO, US). NOTE: Bicknell (1901) cited 3 syntypes.

Sisyrinchium flagellum E.P. Bicknell, Bull. Torrey Bot. Club 26: 226. May 1899. **LECTOTYPE** (designated here): **USA. Florida**. [Monroe Co.]: "[Big] Pine Key," pre 1853, *Blodgett s.n.* (NY). NOTE: *S. flagellum* was previously lectotypified (Ward 1999) by a Manatee Co. specimen (*Rothrock*, NY), in error. The Manatee Co. plant has coarse leaves, in serious conflict with Bicknell's description (0.5-1.5 mm. wide). Art. 9.17(b) permits the correction. If considered synonymous with *S. miamiense*, the latter name was chosen for the combined taxon by Ward (1976).

Sisyrinchium flaviflorum E.P. Bicknell, Bull. Torrey Bot. Club 26: 345. Jul 1899. **HOLOTYPE: USA. Missouri**. [Jackson Co.]: "Courtney," 7 Jun 1892, *Bush s.n.* (MO).

Sisyrinchium flexile E.P. Bicknell, Bull. Torrey Bot. Club 26: 613. Dec 1899. **LECTOTYPE** (designated here): **USA. Mississippi**. [Jackson Co.]: "Petit Bois Island," 8 May 1898, *Tracy 4469* (NY; isolectotype US). NOTE: This typification confirms choice made by Hornberger (1987, in ms.). She termed the NY specimen to be "holotype," but neither specimen was marked as type by Bicknell.

Sisyrinchium floridanum E.P. Bicknell, Bull. Torrey Bot. Club 26: 222. May 1899. **HOLOTYPE: USA. Florida**. [Lake Co.]: "Dry sandy hillside, Lake Dot, Eustis," 12 Mar 1894, *Nash 13* (NY; isotypes BH, GH, MICH, MO, NDG, NY, US). Nom. illeg.: non *S. floridanum* Raf (1840). Nom. succed.: *Sisyrinchium bicknellianum* M.L. Fernald (Rhodora 46: 43. 1944). NOTE: Isotypes are per Hornberger (1987, in ms.).

Sisyrinchium furcatum E.P. Bicknell, Bull. Torrey Bot. Club 26: 229. May 1899. **HOLOTYPE: USA. Louisiana**. [Tangipahoa Par.]: "Pine lands, Hammond," 4 Apr 1989, *Gallup 18* (US).

Sisyrinchium fuscatum E.P. Bicknell, Bull. Torrey Bot. Club 26: 225. May 1899. **LECTOTYPE** (designated by Ward, Taxon 48: 583. 1999): **USA. Alabama**. [Escambia Co.]: "Flomaton," 23 Apr 1898, *Baker 1493* (NY; isolectotype US). NOTE: Selected from 4 syntypes. If considered synonymous with *S. nashii*, the latter name was chosen for the combined taxon by Wunderlin (1985).

Sisyrinchium graminoides E.P. Bicknell, Bull. Torrey Bot. Club 23: 133. 1896. Nom. nov.: *S. gramineum* Curtis (1799), non Lam. (1783); *S. bermudianum* auth., non L. (1753); *S. anceps* Watson (1890), non Cav. (1788). Nom. succed.: *Sisyrinchium angustifolium* Mill. (1768). NOTE: For nomenclature, see Ward (1968).

Sisyrinchium greenei E.P. Bicknell, Bull. Torrey Bot. Club 31: 383. 1904. **HOLOTYPE: USA. California**. [Siskiyou Co.]: "North side of Mount Shasta," 11-16 Jun 1897, *Brown 351* (NY; isotypes CAS, MIN, MO, US).

Sisyrinchium hastile E.P. Bicknell, Bull. Torrey Bot. Club 26: 297. Jun 1899. **LECTOTYPE** (designated here): **USA. Michigan**. [Wayne Co.]: "Sandy shores of Belle Isle in Detroit River," 2 Jun 1896, *Farwell 867* (NY; isolectotypes BLH, GH). NOTE: A species of unknown affinities, perhaps of horticultural origin. E.J. Alexander in Gleason (1952) identified it as *S. jucundum* E. Meyer, from S. America.; Voss (1972) observed it did not quite match that species and tentatively referred it to *S. pringlei* Robins. & Greenm. of Mexico. [The plant of horticulture is probably *S. juncifolium* Herb., of Chile (Dress 1976).] Bicknell had noted "spathes in a conjugate pair," a trait of *S. albidum*, a Michigan native. But he also reported "partly free filaments," a trait not found in any native northeast *Sisyrinchium*. Hornberger (1987, in ms.) placed the name in synonymy of both *S. albidum* Raf. (p. 89) and *S. mucronatum* Michx. (p. 179), without comment. Voss and Reznicek (2012) suggested it be referred to *S. capillare* Bickn., a species also with paired spathes (but with wholly-connate filaments), native to the coastal Southeast (Virginia to Georgia).

Sisyrinchium helleri E.P. Bicknell, Bull. Torrey Bot. Club 28: 590. 1901. **LECTOTYPE** (designated here): **USA. Texas**. [Nueces Co.]: "Along Corpus Christi bay," 9-12 April 1894, *Heller 1552* (NY; isolectotype US). NOTE: If considered synonymous with *S. pruinosum*, the latter name was chosen for the combined taxon by R.L. Oliver (in Correll & Johnston, 1970).

Sisyrinchium hesperium E.P. Bicknell, Bull. Torrey Bot. Club 31: 390. 1904. **HOLOTYPE: USA. California**. [Santa Barbara Co.?]: "Dutard's Ranch, near the boundary between Santa Barbara and San Luis Obispo counties," 9 May 1896, *Eastwood s.n.* (CAS).

Sisyrinchium heterocarpum E.P. Bicknell, Bull. Torrey Bot. Club 26: 348. Jul 1899. **LECTOTYPE** (designated by Cholewa & Henderson, Brittonia 36: 358. 1984): **USA. Wyoming**. [Goshen Co.]: "Table Mountain," 30 Jun 1895, *Nelson 1390* (MO; isolectotypes MIN, NY, WIS). NOTE: Bicknell cited 3 syntypes.

Sisyrinchium idahoense E.P. Bicknell, Bull. Torrey Bot. Club 26: 445. Aug 1899. **LECTOTYPE** (designated by Henderson, Brittonia 28: 175. 1976): **USA. Idaho**. [Nez Perce Co.]: "Valley of Big Potlatch River," 6 Jun 1892, *Sandberg 317.* (US; isolectotype NY). NOTE: Of 10 collections cited by Bicknell, none was designated as type. Though Henderson (1976) has stated the US specimen to be the holotype, it is better to consider his designation as lectotype. If considered synonymous with *S. occidentale*, the present name was chosen for the combined taxon by Henderson (1976).

Sisyrinchium implicatum E.P. Bicknell, Bull. Torrey Bot. Club 26: 228. May 1899. **HOLOTYPE: USA. Mississippi**. [Calhoun Co.]: "Wet bottoms," Apr 1858, *Hilgard s.n.* (MO).

Sisyrinchium incrustatum E.P. Bicknell, Bull. Torrey Bot. Club 26: 606. Dec 1899. **LECTOTYPE** (designated here): **USA. North Carolina**. [Forsythe Co.]: "Open grassy wooded hillside, near Winston," Jul 1897, *Ashe 2257* (NCU). NOTE: Type chosen from 3 syntypes cited by Bicknell.

Sisyrinchium intermedium E.P. Bicknell, Bull. Torrey Bot. Club 26: 498. Sept 1899. **LECTOTYPE** (designated here): **USA. North Carolina**. [Buncombe Co.]: "Open woodlands, Biltmore," 8 May 1897, *Ashe s.n.* (GH; isolectotypes MO, NCSC, NCU, NY, PH). NOTE: Type chosen from 10 syntypes cited by Bicknell, in agreement with selection by Hornberger (1987, ms.). Printed label reads "Biltmore Herbarium 4602b." But collector/correspondent was surely W.W. Ashe.

Sisyrinchium leptocaulon E.P. Bicknell, Bull. Torrey Bot. Club 26: 451. Aug 1899. **LECTOTYPE** (designated by Henderson, Brittonia 28: 167. 1976): **USA. Nevada**. [Elko Co.]: "Deeth," 14 Jul 1896, *Greene s.n.* (NY; isolectotype NDG).

Sisyrinchium longifolium E.P. Bicknell, Small, Fl. S.E. U.S. ed. 1, 300, 1329. 1903. Nom. illeg., non *S. longifolium* Phil. (1895). **HOLOTYPE: USA. Florida**. [Manatee Co.]: "Manatee," 8 May 1900, *Tracy 6672* (NY). NOTE: Second collection from same location (7 May 1900, *Tracy 6673*) marked by Bicknell as "very unlike type." Hornberger (1986 annot.): *Tracy 6672* is *S. atlanticum*, *Tracy 6673* is *S. nashii*.

Sisyrinchium longipedunculatum E.P. Bicknell, Bull. Torrey Bot. Club 28: 577. 1901. **HOLOTYPE: USA. Texas**. [Culberson Co.]: "On top of Guadaloupe Mountains," Oct 1881, *Havard s.n.* (US).

Hydastylus longipes E.P. Bicknell, Bull. Torrey Bot. Club 27: 382. Jul 1900. **LECTOTYPE** (designated here): **USA. Arizona**. [Coconino Co.]: "San Francisco mountain," 18 Aug 1889, *Knowlton 34* (NY, not confirmed; US). Basionym for *Sisyrinchium longipes* (Bicknell) Kearney & Peebles, Wash. Acad. Sci. 29:474. 1939. NOTE: Type chosen from 5 syntypes cited by Bicknell. A different syntype, *Townsend 69* (NDG), from Chihuahua, Mexico, has been proposed by B. Hellenthal (annot. on sheet, Aug 2013).

Sisyrinchium macounii E.P. Bicknell, Bull. Torrey Bot. Club 27: 245. May 1900. **LECTOTYPE** (designated by Henderson, Brittonia 28: 172. 1976): **CANADA. British Columbia**. [Vancouver Island], "meadows, Comox," 21 Jun 1893, *Macoun 4393* (CAN; isolectotype GH). Henderson used "holotype" in reference to the CAN specimen, corrected here.

Sisyrinchium macrocarpon E.P. Bicknell, Bull. Torrey Bot. Club 28: 576. 1901. **LECTOTYPE** (designated here): **USA. Arizona**. [Coconino Co.]: "Willow Springs," 10-20 Jun 1890, *Palmer 490a* (US; isolectotype GH).

Sisyrinchium membranaceum E.P. Bicknell, Bull. Torrey Bot. Club 26: 612. Dec 1899. **NEOTYPE** (selected here): **USA. Florida**. [Jackson Co.]: "4.7 mi. n. of Marianna; many plants observed, all with white perianths," 22 Apr 1987, *Godfrey 82351* (FLAS; isoneotype FSU); det. as *S. angustifolium* Mill., by M. Drummond. NOTE: The holotype (Florida, Jackson Co., Marianna, 20 Apr 1899, *Ashe?*) is now lost, presumably with destruction of the Biltmore Herbarium, Asheville, NC. Spm. selected here is geographically correct. But Bicknell's description does not fully match any known Florida *Sisyrinchium* (fls. described as "violet-blue," etc.).

Sisyrinchium miamiense E.P. Bicknell, Bull. Torrey Bot. Club 26: 226. May 1899. **LECTOTYPE** (designated here): **USA. Florida**. [Dade Co.]: "Miami," 4-7 Apr 1898, *Pollard & Collins 264* (NY; isolectotypes MIN, NDG, US). NOTE: Photo of type: Ward (1976).

Sisyrinchium nanum E.P. Bicknell, Bull. Torrey Bot. Club 26: 615. Dec 1899. **HOLOTYPE: USA. Mississippi**. [Jackson Co.]: "Horn Island," 1 Jun 1898, *Tracy 5346* (NY). Nom. illeg., non *S. nanum* Phil. (1895).

Sisyrinchium nashii E.P. Bicknell, Bull. Torrey Bot. Club 26: 223. May 1899. **LECTOTYPE** (designated by Ward, Taxon 48: 583. 1999): **USA. Florida**. [Lake Co.]: "Dry sandy soil of low pine land region, Lake Swatara, Eustis," 24 Jul 1894, *Nash 1395* (NY; isolectotypes GH, MICH, MIN, US). NOTE: Type chosen from 2 syntypes cited by Bicknell.

Sisyrinchium occidentale E.P. Bicknell, Bull. Torrey Bot. Club 26: 447. Aug 1899. **LECTOTYPE** (designated by Henderson, Brittonia 28: 174. 1976): **USA. Idaho**. [Butte Co.]: "Arco," 18 Jun

1893, *Palmer 165* (US; isolectotypes MICH, WIS). NOTE: The specimen chosen by Henderson is one of 17 syntypes cited by Bicknell.

Sisyrinchium oreophilum E.P. Bicknell, Bull. Torrey Bot. Club 31: 381. 1904. **HOLOTYPE: USA. California**. [Mariposa Co.]: "Yosemite Valley," May-Jun 1900, *Bioletti s.n.* (CAS).

Hydastylus parvus E.P. Bicknell, Bull. Torrey Bot. Club 27: 384. Jul 1900. **HOLOTYPE: MEXICO. Coahuila**. "Low valley near Saltillo," 22 Mar 1847, *Gregg 340* (MO). [*Sisyrinchium parvum* (Bickn.) ined.] = *Sisyrinchium schaffneri* Watson.

Sisyrinchium pruinosum E.P. Bicknell, Bull. Torrey Bot. Club 28: 578. 1901. **LECTOTYPE** (designated here): **USA. Texas**. [Dallas Co.]: "Common in woods, Dallas," 13 Apr 1900, *Bush 561* (NY; isolectotype MO). NOTE: Type chosen from 2 syntypes. Type not designated by Bicknell in publication of the species, but written on herbarium label.

Sisyrinchium radicatum E.P. Bicknell, Bull. Torrey Bot. Club 28: 576. 1901. **LECTOTYPE** (designated here): **USA. Utah**. [Washington Co.]: "St. George," 1877, *Palmer 456* (NY; isolectotypes GH, ISC).

Sisyrinchium recurvatum E.P. Bicknell, Small, Fl. S.E. U.S. ed. 1, 299, 1329. 1903. **HOLOTYPE** (designated by Bicknell in Small): **USA. Florida**. [Manatee Co.]: "In sand, Longboat Key," May 1900, *Tracy 6675* (NY; isotype NY).

Hydastylus rivularis E.P. Bicknell, Bull. Torrey Bot. Club 27: 381. Jul 1900. **LECTOTYPE** (designated here): **USA. California**. [Fresno Co.]: "Ford of Bubb's Creek," 5 Jul 1899, *Eastwood s.n.* (NY; isolectotype NDG). = *Sisyrinchium elmeri* Greene, Pittonia 2: 106. 1890. NOTE: Type chosen from 3 syntypes cited by Bicknell.

Sisyrinchium rosulatum E.P. Bicknell, Bull. Torrey Bot. Club 26: 228. May 1899. **LECTOTYPE** (designated here): **USA. South Carolina**. [Charleston Co.]: "Sullivan's Island," 8 May 1852, *Gibbes s.n.* (NY). NOTE: Type chosen from 2 syntypes cited by Bicknell.

Sisyrinchium rufipes E.P. Bicknell, Bull. Torrey Bot. Club 26: 224. May 1899. **HOLOTYPE: USA. Georgia**. [Richmond Co.]: "Dry sand hills, Augusta," 24 Mar [1899], *Cuthbert s.n.* (NY). NOTE: If considered synonymous with *S. fuscatum*, the latter name was chosen for the combined taxon by Cholewa and Henderson (2002).

Sisyrinchium sagittiferum E.P. Bicknell, Bull. Torrey Bot. Club 26: 230. May 1899. **HOLOTYPE: USA. Texas**. [Bastrop Co.]: "On sand bars in the Colorado [River], opposite Bastrop," 1 May 1839, *Riddell s.n.* (NY).

Sisyrinchium scabrellum E.P. Bicknell, Bull. Torrey Bot. Club 26: 230. May 1899. **LECTOTYPE** (designated here): **USA. North Carolina**. [Buncombe Co.]: "Near Biltmore," 10 May 1898, *Biltmore Herbarium 5752b* (NSC; isolectotypes MO, NY, US). NOTE: Type chosen from 2 syntypes cited by Bicknell. Type chosen is in agreement with O'Connell (1955, in ms.) and Hornberger (1987, in ms.).

Sisyrinchium scoparium E.P. Bicknell, Bull. Torrey Bot. Club 26: 227. May 1899. **LECTOTYPE** (designated here): **USA. Mississippi**. [Harrison Co.]: "Biloxi," 27 Apr 1898, *Baker 1496* (NY). NOTE: Bicknell stated type was in herbarium of Alabama Biol. Survey (present location unknown, perhaps lost by destruction of the Auburn Univ. herbarium, by fire); but his description must have been drawn from the specimen selected here, a duplicate. Bicknell cited one paratype, also from Biloxi: *Tracy* (NY).

Sisyrinchium segetum E.P. Bicknell, Bull. Torrey Bot. Club 26: 449. Aug 1899. **LECTOTYPE** (designated by Henderson, Brittonia 28: 174. 1976): **USA. Washington**. [King Co.]: "In full flower, Seattle," May 1892, *Piper s.n.* (NY; isolectotypes GH, US). NOTE: Bicknell cited 5 syntypes. If considered synonymous with *S. occidentale*, the latter name was chosen for the combined taxon by Henderson (1976).

Sisyrinchium septentrionale E.P. Bicknell, Bull. Torrey Bot. Club 26: 452. Aug 1899. **LECTOTYPE** (designated by Henderson, Brittonia 28: 166. 1976): **CANADA. Alberta**. "National Park, near Banff," 8 Jul 1891, *Macoun 4392* (MO; isolectotypes GH, NY, US). NOTE: Bicknell cited 3 syntypes.

Hydastylus serrulatus E.P. Bicknell, Bull. Torrey Bot. Club 27: 385. Jul 1900. **HOLOTYPE**: **MEXICO. Veracruz**. "In the mountains, Orizaba," (date?), *Botteri 1856* (ALU, not confirmed). Basionym for: *Sisyrinchium serrulatum* (Bickn.) Espe & Lopez-Ferr., Acta Bot. Mex. 41:4. 1997.

Sisyrinchium solstitiale E.P. Bicknell, Bull. Torrey Bot. Club 26: 219. May 1899. **NEOTYPE** (selected here): **USA. Florida**. [Lake Co.]: "Dry sandy soil, Eustis," 20 Mar 1894, *Nash 133* (NDG; isoneotypes BH, GH, MIN, MO, NY, US). NOTE: The specimen designated as type by Bicknell (Lake Co.: "High pine land, Eustis," 10 Aug 1894, *Nash s.n.*), then in the private herbarium of G.V. Nash, is now lost, presumably in the destruction of the Biltmore Herbarium, Asheville, NC. Hornberger (1987, in ms.) suggested a 1901 collection from Dade Co. (*Small & Nash 272* - NY) as neotype. However, neotype chosen here is by same collector and location/year as lost original, and is widely distributed. This collection is also the type of *X. xerophyllum* Greene (Mar 1899), thus establishing unequivocal synonymy.

Sisyrinchium strictum E.P. Bicknell, Bull. Torrey Bot. Club 26: 299. Jun 1899. **LECTOTYPE** (designated here): **USA. Michigan**. [Montcalm Co.]: "Vestaburg," 22 Jun 1898, *Wheeler s.n.* (NY, 2 sheets; isolectotype MICH). NOTE: Voss (1967, 1972) early identified the specimens used by Bicknell, but did not select either as type (he did call MICH an "apparent isotype"); this omission remedied here.

Sisyrinchium subcernuum E.P. Bicknell, Bull. Torrey Bot. Club 27: 385. Jul 1900. **HOLOTYPE** (designated by Bicknell): **MEXICO. Baja California Sur**. "Sierra de la Laguna," 22 Jan [1899], *Brandegee s.n.* (CAS). Basionym for *Hydastylus subcernuus* (Bickn.) J.E. Henrich & P. Goldblatt, Ann. Missouri Bot. Gard. 74: 908. 1988.

Sisyrinchium tenellum E.P. Bicknell, Bull. Torrey Bot. Club 26: 610. Dec 1899. **LECTOTYPE** (designated here): **USA. Alabama**. [Lee Co.]: "Auburn," 9 May 1896, *Earle s.n.* (NY, 2 sheets). NOTE: Type chosen from 5 syntypes cited by Bicknell. Type chosen here is in agreement with Hornberger (1987, in ms.).

Sisyrinchium texanum E.P. Bicknell, Bull. Torrey Bot. Club 28: 578. 1901. **LECTOTYPE** (designated here): **USA. Texas**. [Harris Co.]: "Houston," 12 Apr 1972, *Hall 636* (NY, 2 sheets; isolectotypes GH, MO, US). NOTE: Type chosen from 3 syntypes cited by Bicknell.

Sisyrinchium tortum E.P. Bicknell, Bull. Torrey Bot. Club 26: 221. May 1899. **LECTOTYPE** (designated by Ward, Taxon 48: 583. 1999): **USA. Mississippi**. [Harrison Co.]: "Biloxi," 20 Mar 1898, *Tracy 4460* (NY; isolectotype PH). NOTE: Type chosen from 2 syntypes cited by Bicknell.

Sisyrinchium tracyi E.P. Bicknell, Bull. Torrey Bot. Club 26: 614. Dec 1899. **LECTOTYPE** (designated here): **USA. Mississippi**. [Harrison Co.]: "Biloxi, Point San Martin," 20 Mar 1898, *Tracy 4459* (NY; isolectotypes NCU, US).

Hydastylus translucens E.P. Bicknell, Bull. Torrey Bot. Club 27: 386. Jul 1900. **HOLOTYPE**: **MEXICO. Baja California Sur**. "Sierra de la Laguna," 24 Jan [1899], *Brandegee s.n.* (CAS). Basionym for *Sisyrinchium translucens* (Bickn.) Espejo & Lopez-Ferr., Acta Bot. Mex. 41: 5. 1997.

Sisyrinchium varians E.P. Bicknell, Bull. Torrey Bot. Club 28: 583. 1901. **HOLOTYPE: USA. Texas.** [Travis Co.]: "Austin," Mar 1870, *Bodin s.n.* (US). NOTE: Bicknell cited 5 paratypes. If considered synonymous with *S. pruinosum*, the latter name was chosen for the combined taxon by R.L. Oliver (in Correll & Johnston 1970).

Sisyrinchium versicolor E.P. Bicknell, Bull. Torrey Bot. Club 26: 606. Dec 1899. **HOLOTYPE: USA. Michigan**. [Wake Co.]: "Hillsides, Raleigh," May 1896, *Ashe 336* (NCU). NOTE: Bicknell also cited 5 paratypes.

Sisyrinchium violaceum E.P. Bicknell, Small, Fl. S.E. U.S. 301, 1329. 1903. **HOLOTYPE: USA. Florida**. "Walton Co.," summer 1885, *Curtiss s.n.* (NY).

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